WHAT IS CLAIMED IS:

1. A method of making a tire, comprising the steps of:

- making a carcass structure (2);

- applying a belt structure (5) to the carcass structure (2) at a circumferentially external position thereof;

- applying a tread band (8) to the belt structure (5) at a circumferentially external position thereof;

- applying at least one pair of sidewalls (9) to the carcass structure (2) at laterally opposite positions;

- vulcanizing the obtained tire (1),

wherein manufacturing of the carcass structure (2) involves formation of at least one carcass ply (3) by the following steps:

- preparing at least one continuous strip-like element (13) comprising a plurality of longitudinal and parallel thread-like elements (13a) at least partly coated with at least one layer of raw elastomer material (13b);

- depositing the strip-like element (13) onto a toroidal support in alternated deposition sections (23, 24) each extending in a substantially U-shaped conformation about the profile in transverse section of the toroidal support (11), to define two side portions (23a, 23c, 24a, 24c) substantially extending in planes orthogonal to a geometric axis of rotation of the toroidal support (11) at mutually spaced apart positions in an axial direction, and a crown portion (23b, 24b) extending in a radially external position between the side portions (23a, 23c, 24a, 24c);

- the crown portions (23b, 24b) of each deposition section (23, 24) being disposed consecutively in side by side relationship along the circumferential extension of the toroidal support (11), whereas the side portions (23a, 23c, 24a, 24c) of each deposition section (23, 24)

are each partly overlapped with a side portion of at least one consecutive deposition section.

2. The method as claimed in claim 1, wherein the side portions (23a, 23c, 24a, 24c) in mutual-overlapping relationship are caused to mutually converge at the geometric axis of rotation of the toroidal support (11).

3. The method as claimed in claim 1, wherein mutual overlapping of the side portions (23a, 23c, 24a, 24c) of the deposition sections (23, 24) progressively decreases starting from a maximum value at the radially inner ends of the side portions until a zero value at transition regions between said side portions and crown portions (23b, 24b).

4. The method as claimed in claim 1, wherein the side portions (23a, 23c, 24a, 24c) in mutual-overlapping relationship are maintained joined to each other at a bending end region (25) where the strip-like element (13) is folded upon itself.

5. The method as claimed in claim 1, wherein the individual deposition sections (23, 24) are sequentially laid down onto the toroidal support (11) according to a circumferential distribution pitch corresponding to the width of the strip-like element (13).

6. The method as claimed in claim 1, wherein the individual deposition sections (23, 24) are sequentially laid down onto the toroidal support (11) according to a circumferential distribution pitch corresponding to a multiple of the width of the strip-like element (13).

7. The method as claimed in claim 1, wherein the strip-like element (13) has a width corresponding to a submultiple of the circumferential extension of the toroidal support (11), as measured at its equatorial plane.

8. The method as claimed in claim 1, wherein manufacturing of said at least one carcass ply (3) further involves a sequential pressing step of the strip-

like element (13) at the side portions (23a, 23c, 24a, 24c) of the deposition sections (23, 24), to define regions of greater width close to the inner circumferential edges of the carcass structure (2).

9. The method as claimed in claim 8, wherein the pressing step is carried out on the strip-like element (13) during the deposition step, by exerting a pressing action of the strip-like element at a section thereof upstream of the toroidal support (11).

10. The method as claimed in claim 8, wherein concurrently with said pressing step, moving apart from each other of the thread-like elements (13a) comprised in the strip-like element (13) is carried out.

11. The method as claimed in claim 1, wherein during the deposition step, at least one deposition section comprising an initial or leading end of the strip-like element is retained on the toroidal support (11) by a suction action produced through the toroidal support itself.

12. The method as claimed in claim 1, wherein formation of each deposition section (23, 24) involves the steps of:

- guiding the strip-like element (13) on a distributor element (22) movable about the profile in transverse section of the toroidal support (11);
- translating the distributor element (22) substantially radially away from the geometric axis of rotation of the toroidal support (11) to form a first side portion (23a, 24a) of the deposition section (23, 24) of the strip-like element (13);
- rotating the toroidal support (11) relative to the distributor element (22) according to an angular pitch corresponding to half the distribution pitch of the deposition sections (23, 24), concurrently with formation of said first side portion (23a, 24a);
- translating the distributor element (11)

substantially in a direction parallel to the geometric axis of rotation of the toroidal support (11) to form the crown portion (23b, 24b) of the deposition section (23, 24) of the strip-like element (13);

- translating the distributor element (22) substantially radially close to the geometric axis of rotation of the toroidal support (11) to form a second side portion (23c, 24c) of the deposition section (23, 24) of the strip-like element (13);

- rotating the toroidal support (11) relative to the distributor element (22) according to said angular pitch, concurrently with formation of said second side portion (23c, 24c).

13. The method as claimed in claim 12, wherein during formation of the first side portion (23a, 24a) of each deposition section (23, 24) the step of retaining the strip-like element (13) at a bending region (25) defined between the first side portion and the second side portion (23a, 24a) of the previously formed deposition section is carried out.

14. The method as claimed in claim 13, wherein retention of the strip-like element (13) is carried out by disposing a retaining element (26) alongside the second side portion (23a, 24a) after translation of the distributor element (22) radially close to the geometric axis of rotation of the toroidal support (11), so that the strip-like element (13) is turned back about the retaining element (26) thereby forming the bending region (25) as a result of translation of the distributor element (22) radially away from the geometric axis of rotation of the toroidal support (11).

15. The method as claimed in claim 14, wherein the retaining element (26) is axially disengaged from the bending region (25), after starting of formation of the crown portion (23b, 24b) of the deposition section (23, 24) being made.

16. The method as claimed in claim 1, further comprising a step of pressing said side portions (23a, 23c, 24a, 24c) of the deposition sections against side walls of the toroidal support (11).

17. The method as claimed in claim 16, wherein said pressing step is carried out repeatedly on a first and a second side portions (23a, 24c, 23c, 24a) belonging to two contiguous deposition sections (23, 24).

18. The method as claimed in claim 1, wherein accomplishment of the carcass structure (2) further comprises the step of applying at least one inextensible annular structure (4) to an area close to each of the inner circumferential edges of the carcass ply (3) obtained from the deposition step.

19. The method as claimed in claim 18, wherein accomplishment of the carcass structure (2) further comprises the step of turning back end flaps of the side portions (23a, 23c, 24a, 24c) about the respective inextensible annular structures (4).

20. The method as claimed in claim 1, wherein accomplishment of the carcass structure (2) further comprises the step of forming a second carcass ply in the same manner as formation of the first carcass ply (3).

21. A method of making a tire, comprising the steps of:

- making a carcass structure (2);
- applying a belt structure (5) to the carcass structure (2) at a circumferentially external position thereof;
- applying a tread band (8) to the belt structure (5) at a circumferentially external position thereof;
- applying at least one pair of sidewalls (9) to the carcass structure (2) at laterally opposite positions;
- vulcanizing the obtained tire (1),

wherein accomplishment of each inextensible annular structure (4) comprises the steps of:

- depositing at least one thread-like element in concentric coils (32a) into a molding cavity (34) to form a circumferentially inextensible annular insert to be positioned substantially parallelly to adjacent surfaces of the carcass ply (3);

- positioning an annular anchoring element (31) into the molding cavity (34), at a position axially close to the circumferentially inextensible annular insert (32);

- injecting raw elastomeric material into the molding cavity (34) to make a filling body (33) intimately joined to the annular anchoring element (31) and the circumferentially inextensible annular insert (32).

22. The method as claimed in claim 21, wherein said deposition step is preceded by a rubberizing step in which said thread-like element is coated with at least one layer of raw elastomer material.

23. The method as claimed in claim 21, further comprising the step of magnetically retaining the circumferentially inextensible annular insert (32), at a predetermined position, within the molding cavity (34).

24. The method as claimed in claim 21, wherein injection of the raw elastomer material is carried out through at least one circumferential admission hollow space (35) opening into the molding cavity (34).

25. A method of making a tire, comprising the steps of:

- making a carcass structure (2);

- applying a belt structure (5) to the carcass structure (2) at a circumferentially external position thereof;

- applying a tread band (8) to the belt structure (5) at a circumferentially external position thereof;

- applying at least one pair of sidewalls (9) to the carcass structure (2) at laterally opposite positions;

- vulcanizing the obtained tire (1),

wherein application of the belt structure (5) comprises the steps of:

- forming at least one continuous belt ribbon (36) comprising at least one layer of raw elastomer material (36b) at least partly incorporating a plurality of longitudinal parallel cords (36a);

- cutting said continuous belt ribbon (36) according to a predetermined inclination relative to its longitudinal extension to form belt lengths (42) having a predetermined size in width, measured perpendicularly to the cutting direction;

- laying down the belt lengths (41) consecutively in circumferential alignment onto the carcass structure (2) to form at least one first continuous belt strip (6) having said cords (36a) disposed transversely according to an inclination corresponding to the cutting inclination of said lengths (42).

26. The method as claimed in claim 25, wherein before said cutting step, the continuous belt ribbon (36) is submitted to a calendering step to give said lengths a circumferential size corresponding to a submultiple of the circumferential extension of the belt strip (6).

27. The method as claimed in claim 25, wherein application of the belt structure (5) further comprises the step of forming at least one second belt strip (7) by winding of at least one continuous thread-like element (44) in coils disposed axially in side by side relationship and extending circumferentially about the first belt strip (6).

28. The method as claimed in claim 27, wherein the winding coils formed by the elongated element (44) are disposed mutually in side by side relationship according to a variable axial-distribution pitch.

29. The method as claimed in claim 28, wherein said axial-distribution pitch is greater close to the equatorial median plane (X-X) of the tire (1) relative

to the opposite side edges of the belt structure (5).

30. The method as claimed in claim 1, wherein application of the tread band (8) comprises the step of circumferentially winding at least one continuous sheet of raw elastomer material (49) about the belt structure (5) in a plurality of radially superposed coils (S).

31. The method as claimed in claim 30, wherein the continuous sheet of elastomer material (49) is produced directly during its application to the belt structure (5).

32. The method as claimed in claim 30, further comprising the step of progressively reducing the width of the elastomer material sheet (49), concurrently with formation of each winding coil (S) about the belt structure (5).

33. The method as claimed in claim 1, wherein each of said sidewalls (9) is made by injection of elastomer material into a mold (53).

34. The method as claimed in claim 33, wherein accomplishment of each of said sidewalls (9) comprises the following steps:

- injecting a first elastomer material into a first cavity defined in said mold (53) to form a radially outer portion (9a) of the sidewall (9);

- defining a second cavity in the mold (53), which is partly delimited by the radially outer portion (9a) of the sidewall (9);

- injecting a second elastomer material into the second cavity of the mold (53) to define a radially inner portion (9b) of the sidewall (9).

35. The method as claimed in claim 1, wherein formation of the carcass ply (3) is preceded by a step of coating the toroidal support (11) with at least one air-proof layer or liner (10) of elastomer material.

36. The method as claimed in claim 35, wherein said coating step is carried out by winding at least one

ribbon-like band (12) of an air-proof elastomer material in coils disposed in side-by-side relationship along the profile in transverse section of the toroidal support (11).

37. The method as claimed in claim 1, wherein before the vulcanization step the following steps are carried out:

- disengaging the tire (1) from the toroidal support (11);
- inserting an air tube into the carcass structure (2).

38. The method as claimed in claim 1, wherein during said vulcanization step, a step of stretching said carcass plies (3) and belt strips (6, 7) is carried out for achieving an expansion of the tire of a linear amount included between 2% and 5%.

add B3

add C9